

**DETAILED ACTION**

***Response to Arguments***

Applicant's arguments filed 03/08/11 have been fully considered but they are not persuasive.

Applicant argues that Thieme does not teach or suggest a "junction auxiliary material" but only refers to a general material (e.g., copper metal or compound) and that "junction auxiliary material" is a particular type of material that operates to unify different materials through diffusion bonding.

However, it is unclear how a "junction auxiliary material" (e.g. copper) of the instant invention is patentably distinct from the copper material of Thieme. It appears that the designation of a "junction auxiliary material" does not impart any particular structure in addition to the limitation of the material (as described at claim 1, lines 13-15, inter alia). Therefore, it appears that Thieme meets the limitation of a "junction auxiliary material".

Applicant's arguments see pages 8, 9, and 11 of Remarks, filed 03/08/11, with respect to the 35 USC 112, 1st and 2nd paragraph and the 35 USC 103 rejections over Thieme in view of Wong and Dunand have been fully considered and are persuasive. The rejection of record in the Non-final Office Action filed 12/08/2010 has been withdrawn.

Additionally, this Office Action is made Non-final because the 35 USC 112, 2nd paragraph rejections of claims 21-24 were not of record in the Office Action mailed 12/08/2010.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 21-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 recites the limitation "the junction auxiliary material" in line 15. There is insufficient antecedent basis for this limitation in the claim.

Claim 22 recites the limitation "the junction auxiliary material" in line 16. There is insufficient antecedent basis for this limitation in the claim.

***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: the limitation in claim 9, lines 11-12, claim 10, lines 13-14, claim 21, lines 11-12, claim 22, lines 12-13, claim 25, lines 8-9, claim 27, lines 8-9 of "integrated metallurgically" does not appear in the specification although there appears to be inherent support for the limitation in claims.

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 9, 10, 12, 14, 15, 17, and 19-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Thieme et al. (U.S. 2003/0036482).

Thieme et al. teach magnesium boride superconducting wires [0002] wherein the magnesium boride, having a density greater than 95% (Abstract) is surrounded by tantalum, niobium, nickel, nickel alloys, iron, or molybdenum, wherein the wire further

comprises a metal laminate on the outside of this barrier layer selected from copper, copper alloys, stainless steel, aluminum, aluminum alloys, or nickel alloys [0016]-[0018].

Additionally, Thieme et al. teach a diffusion barrier surrounding the superconductor comprising iron, nickel alloys, tungsten, and molybdenum (this layer corresponds to the metal cladding layer of the instant claims, [0016]) wherein the matrix, which overlays the diffusion barrier layer, is copper (this layer corresponds to the junction material between the base metal and the metal cladding of the instant claims, [0015]), wherein the laminate, overlaying the matrix, is made of copper alloy, *inter alia* (this layer corresponds to the metal base of the instant claims, [0018]).

Additionally, it appears that the diffusion barrier layer (cladding layer) can have an electric resistance of  $7\ \mu\Omega$  or less at room temperature for other embodiments when formed of nickel, *inter alia*. Additionally, it appears that for some embodiments the (diffusion barrier) cladding layer inherently has a Vickers hardness of at least 50 at room temperature as it is made of a similar element, eg. iron, as that instantly claimed.

Additionally, it appears that the laminate (metal base member) can have a Vickers hardness of at least 50 at room temperature as it is made of a substantially similar element, eg. stainless steel containing iron, as that instantly claimed. Additionally, it appears that for some embodiments the laminate (metal base member) inherently has an electric resistance of  $7\ \mu\Omega$  or less at room temperature as it is made of a substantially similar element, eg. copper and nickel, as that instantly claimed.

Additionally, as the laminate (metal base member) covers the matrix (junction auxiliary material) and the barrier layer (cladding layer) [0018], it appears that the metal base member is coaxial with the tubular-shaped metal cladding layer.

Thieme teaches that one or more Mg-B regions are embedded in the matrix [0012]. It appears that a barrier layer (cladding layer) would accompany each Mg-B region [0016] such that there is a plurality of cladding layers as in instant claims 21, 22.

Regarding the limitation of the junction auxiliary material electrically and mechanically unified and integrated metallurgically with the base member and cladding layer in a unitary block and that there would not be a gap formed between the metal base wire member and the cladding layers, it appears that Thieme teaches a heat treatment that is substantially similar to the heat treatment instantly claimed [0095] such that one of ordinary skill would recognize that the product produced by the heat treatment of Thieme would inherently exhibit the junction auxiliary material electrically and mechanically unified with the base member and cladding layer in a unitary block and that there would not be a gap formed between the metal base wire member and the cladding layers.

Where the claimed and prior art product(s) are identical or substantially identical, the burden of proof is on applicant to establish that the prior art product(s) do not necessarily or inherently possess the characteristics of the instantly claimed product(s), see *In re Best*, 195 USPQ 430.

Any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made

because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show the same process of making, see In re Brown, 173 USPQ 685, In re Fessmann, 180 USPQ 324, In re Spada, 15 USPQ2d 1655, In re Fitzgerald, 205 USPQ 594 and MPEP 2113.

As to the limitation of "is assembled into", it is unclear how this limitation lends a patentable distinction between the claimed invention and the prior art. It appears that the prior art meets this limitation as the superconductor and covering metal are abutting the base material (outer covering).

Regarding claims 12 and 17, Thieme teaches that the magnesium boride has a density greater than 95% (Abstract).

Regarding claims 14 and 19, Thieme teaches that the diffusion barrier surrounding the superconductor comprises nickel alloys and molybdenum (this layer corresponds to the metal cladding layer of the instant claims, [0016]).

Regarding claims 15 and 20, Thieme teaches that the laminate (metal base member) comprises nickel alloys [0018].

Regarding claim 21, Thieme teaches that the laminate (metal base member) comprises stainless steel (which includes iron) [0018].

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thieme et al. (U.S. 2003/0036482) in view of Nakahara et al. (U.S. 6337307).

Thieme et al. teach a compound sheath as described above.

Thieme et al. fail to teach a plurality of the single-core or multi-core wires are assembled into the base metal and they are twisted.

Nakahara et al. teach a superconductor (col. 1) wherein a plurality of single-core wires are assembled into a base metal that are twisted (col. 11-12).

It would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide a plurality of single-core wires assembled into a base metal that are twisted in Thieme et al. in order to produce a known superconducting wire as taught by Nakahara et al.

***Allowable Subject Matter***

Claims 23 and 24 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior of record does not teach or suggest the compound sheath of claims 21 and 22, respectively further comprising that the intermediate layer is a tin alloy. Specifically, the closest prior art, U.S. 2003/0036482, teaches an intermediate layer but fails to teach or suggest that the intermediate layer comprises tin. Additionally, it would

not have been obvious to one of ordinary skill in the art that the intermediate layer comprise tin in the absence of applicant's disclosure.

Claims 25-28 are allowed.

The following is an examiner's statement of reasons for allowance: the prior of record does not teach or suggest the compound sheath of claims 25 and 27, respectively further comprising that the intermediate layer is a tin alloy. Specifically, the closest prior art, U.S. 2003/0036482, teaches an intermediate layer but fails to teach or suggest that the intermediate layer comprises tin. Additionally, it would not have been obvious to one of ordinary skill in the art that the intermediate layer comprise tin in the absence of applicant's disclosure.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."



***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL A. WARTALOWICZ whose telephone number is (571)272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica L. Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul A Wartalowicz/  
Examiner, Art Unit 1735